

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

REC'D 07 JUL 2004

WIPO PCT

Applicant's or agent's file reference <b>BW234M</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. <b>PCT/IT 02/00232</b>	International filing date (day/month/year) <b>12.04.2002</b>	Priority date (day/month/year) <b>12.04.2002</b>
International Patent Classification (IPC) or both national classification and IPC <b>F41H11/12</b>		
Applicant <b>EURONORD S.A.S. DI G.B. MARCOLLA &amp; C. et Al.</b>		

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of 5 sheets, including this cover sheet.
	<input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  These annexes consist of a total of 3 sheets.
3.	This report contains indications relating to the following items:  I <input checked="" type="checkbox"/> Basis of the opinion II <input type="checkbox"/> Priority III <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand  <b>11.11.2003</b>	Date of completion of this report  <b>07.07.2004</b>
Name and mailing address of the international preliminary examining authority:   <b>European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016</b>	Authorized Officer  <b>Giesen, M</b>  Telephone No. +31 70 340-3747  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/IT 02/00232

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

2-4 as originally filed  
1, 1a filed with telefax on 11.06.2004

**Claims, Numbers**

1-10 filed with telefax on 11.06.2004

**Drawings, Sheets**

1/1 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 1-10

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the said claims Nos. 1-10

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	4
	No: Claims	1-3
Inventive step (IS)	Yes: Claims	
	No: Claims	1-4
Industrial applicability (IA)	Yes: Claims	1-4
	No: Claims	

2. Citations and explanations

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IT 02/00232

**Re Item I**

This International Preliminary Examination Report is based on:

Description: pages 2 - 4 as originally filed;  
pages 1 and 1a as filed with fax of 11.06.2004;  
Claims: 1 - 4 as originally filed (see point III of this Report);  
Drawings: 1/1 as originally filed.

**Re Item III**

1. The amended claims filed with fax of 11.06.2004 comprise features taken from the description, which features have not been the subject of the search in the PCT Chapter I (search-) phase.

Consequently, no preliminary examination report can be formulated for the amended claims.

2. The features of the pre-characterising part of present claim 1 were part of originally filed claims 1 and 2.

The features of the characterising part were not present in the claims as originally filed and hence have not been subject of the search during the PCT Chapter I phase.

3. Dependent claims 2 - 10 only comprise features from the description, which were not part of the claims as originally filed and hence the amended dependent claims have not been subject of the search during the PCT Chapter I phase.

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. As indicated in point III above, the amended claims as filed with the fax of 11.06.2004 all comprise features taken from the description, which features have not been the subject of the search in the PCT Chapter I phase.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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The preliminary examination is therefore carried out on the claims 1 - 4 as originally filed.

2. In respect of the claims 1 - 4 as originally filed, the following objections have to be raised:

2.1 DE 44 17 262 A (D1) describes a mine removal system in mined areas formed by three independent and co-ordinated modular units (1, 3, 5).

Consequently the subject matter of independent claim 1 does not meet the requirement of novelty of Article 33 PCT.

2.2. Dependent claims 2 - 4 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, the reasons being as follows:

The features of dependent claims 2 and 3 are known from D1.

The features of dependent claim 4 are known from "Water jet system could deactivate battlefield land mines" NTIS Tech notes 1992 August (D2), as well as JP 2000 171 198 A (D3).

"INTEGRATED FLEXIBLE MODULAR STRUCTURE FOR  
RECLAIMING MINED AREAS"

5       The present invention relates to a system for reclaiming mined areas and in particular to an integrated, modular and flexible system for locating, controlling and neutralizing antipersonnel mines.

It is known that the presence of areas strewn with mines or generally with booby traps of any kind, and prepared by one or more belligerents for the sake of  
10       offending-defending is a serious humanitarian problem, in particular for the civil populations during and after the termination of conflicts, a problem that turns finally out in an economic burden, involving in addition implications of many-sided nature.

On the other hand, the reclaiming of such areas carried out by human  
15       personnel, provided when possible with right special equipment, besides being dangerous to the charged people, it is particularly time-consuming and complex.

DE4417262 describes a mine removal system comprising a central unit which controls a mine-locating terrestrial vehicle and a mine-deactivating vehicle. The mine-locating terrestrial vehicle is provided with one or more sensors selected  
20       among radar sensors, ultrasound sensors, infrared sensors, X-ray sensors, pressure sensors, optical sensors or magnetic sensors. An airplane using a SAR system and/or a satellite are intended to provide a first, rough location of the mines and are connected to said central unit which, accordingly to the information received, directs the mine-locating terrestrial vehicle.

25       However, said system is very complicated since its procedure for locating the mines is based on two steps: a first rough location by means of a satellite and a second location step by the terrestrial vehicle. Further, the system is not suitable to recognize a mine with a single kind of sensor, independently on the mine size and on the material of which its shell is formed.

30       Systems comprising means for deactivating land mines through a high-pressure water jet are also known, for example from the article "Water jet system

could deactivate battlefield land mines" NTIS Tech Notes, (1992) US Department of Commerce, Springfield, VA, US, or from the application JP 2000 171198. However, these systems do not comprise means for the location of the mines.

5 The object of the present invention is therefore to propose an integrated system which is safe to the assigned personnel, cheap, quickly feasible and exhaustive with respect to the completeness of the operation.

10 This and other objects and advantages of the system according to the present invention will become more evident from the following specification that refers to a sole drawing, appended as Fig. 1, schematically showing the components of this system.

15 The proposed system comprises essentially three mutually integrated operating elements, namely: a remote controlled air-means A provided with a maneuverable mechanical arm, a tracked or wheeled terrestrial means T also remote controlled and provided in turn with a mechanical arm, and a further terrestrial means C having manned crew, for the remote survey and a possible corrective intervention on said means in case of need.

The remote controlled air-means A is an aircraft with rotating blades (helicopter or the like, capable of hovering), that by operating at low altitude is

CLAIMS

1. A mine removal system in mined areas, comprising three independent and co-ordinated modular units (C, A, T) respectively formed of a remote controlled air-means (A) acting above the ground; a remote controlled self-propelled terrestrial means (T), and autonomous terrestrial means (C) with manned crew forming the control and check unit of the system, characterized in that said air-means is an aircraft provided with a maneuverable mechanical arm and a nuclearly scanning sensor capable of effecting survey of the underlying ground.
2. A mine removal system according to claim 1, characterized in that said terrestrial means (T) is provided with a gun able to shoot shells formed of solid, semisolid or liquid masses.
3. A mine removal system according to claim 2, characterized in that said gun uses a fire-producing propellant.
4. A mine removal system according to claim 3, characterized in that said fire-producing propellant is ballistite.
5. A mine removal system according to claim 4, characterized in that said gun uses a high pressure mixed propellant in connection with a powerful compressor.
6. A mine removal system according to claim 1 or 2, characterized in that said maneuverable mechanical arm is electrically or hydraulically operated and has an action range of about 280°.
7. A mine removal system according to claim 1 or 2, characterized in that said terrestrial means (T) is provided with a multifunctional articulated arm on which there are mounted mechanical drilling and grasping means with pressure sensor able to determine the consistency of possible bodies to be picked up and to consequently modify the grasping force without squashing.
8. A mine removal system according to claim 7, characterized in that said multifunctional arm is articulated on four rotary joints and a 360° rotating fifth wheel.
9. A mine removal system according to any of the preceding claims, characterized in that said terrestrial means (T) is wheeled with four or six independent driving wheels, each being equipped with an autonomous electrically or hydropneumatically operated motor.
10. A mine removal system according to any of claims 7 to 9, characterized in that said grasping means are formed of an electro-hydraulic telescopic gripper.